Linear Algebra 3450:312 Summer 2006

3450:312:301 MTWTh 12:00pm–1:15pm, 6/19/06–8/12/06, Olin 374

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Office Hours: MTWTh 11:00am–11:50am, other hours by appointment

Course Outline

1. Linear Equations in Linear Algebra
   - 1.1 Systems of Linear Equations
   - 1.2 Row Reduction and Echelon Forms
   - 1.3 Vector Equations
   - 1.4 The Matrix Equation \(Ax = b\)
   - 1.5 Solution Sets of Linear Systems
   - 1.7 Linear Independence
   - 1.8 Introduction to Linear Transformations
   - 1.9 The Matrix of a Linear Transformation

2. Matrix Algebra
   - 2.1 Matrix Operations
   - 2.2 The Inverse of a Matrix
   - 2.3 Characterizations of Invertible Matrices
   - 2.4 Partitioned Matrices
   - 2.5 Matrix Factorizations
   - 2.8 Subspaces of \(\mathbb{R}^n\)
   - 2.9 Dimension and Rank

3. Test 1

4. Determinants
   - 3.1 Introduction to Determinants
   - 3.2 Properties of Determinants
   - 3.3 Cramer’s Rule, Volume and Linear Transformations

5. Vector Spaces
   - 4.1 Vector Spaces and Subspaces
6. **Test 2**

7. **Eigenvalues and Eigenvectors**
   - 5.1 Eigenvalues and Eigenvectors
   - 5.2 The Characteristic Equation
   - 5.3 Diagonalization
   - 5.4 Eigenvectors and Linear Transformations
   - 5.5 Complex Eigenvalues

8. **Orthogonality and Least Squares**
   - 6.1 Inner Product, Length and Orthogonality
   - 6.2 Orthogonal Sets
   - 6.3 Orthogonal Projections
   - 6.4 The Gram-Schmidt Process
   - 6.5 Least-Squares Problems
   - 6.7 Inner Product Spaces

9. **Test 3**

**Policy**

1. Any student who is not on the class list will not be allowed to participate in the class in any way, including attending, or having any work graded.

2. Inappropriate behaviour in the classroom may be grounds for academic discipline, up to, and including dismissal from the course. In particular, disruption of the class by cell phones or pagers will not be tolerated.

3. Incompletes will only be given in documentable cases of long-term illness, or similar problems. In addition, at least half of the semester’s work must have been completed, with at least an average grade of C. College policy also states that a student may not sit in on the course the next semester to make up the incomplete, but only to make up the missed work.
4. Attendance is required by University policy.

5. The University withdrawal policy is in effect. That is, you may withdraw up to July 28th.

6. Homework will be assigned for most sections, and may be collected periodically, with selected problems graded. In general, the homework will be due the class period after a topic is completed. In addition, there will be separate homework problems given and a possibility of quizzes.

   **All work submitted must be your own.**

   **Late homework will be accepted at my discretion.**

7. The final scale will be *no higher* than A : 90+ average, B : 80-89 average, C : 70-79 average, D : 60-69 average. Plus and minus grades will be used at my discretion. The averages will be based on 3 tests @ 100 points each and the homework/quiz average @ 100 points.

8. If you are going to miss a test (which will be announced a few days in advance), you must have a valid, documentable excuse *and* notify me *in advance*, or as soon as reasonable afterward. The make-up will be as soon as possible, generally within a week of the original test date.